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# Contributing Factors and Mental Health Outcomes of First Suicide Attempt During Childhood and Adolescence: Results From a Nationally Representative Study

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## ABSTRACT

**Objective:** To investigate whether risk factors for suicide attempts differ in children and adolescents and to categorize adulthood mental health outcomes of child and adolescent suicide attempters in the general population.

**Methods:** Using a large (N = 34,653), nationally representative US adult sample, the 2004–2005 National Epidemiologic Survey on Alcohol and Related Conditions, we examined whether individuals who first attempted suicide during childhood (under the age of 13 years) differ from those who first attempted suicide during adolescence (13 through 17 years) in (1) contributing factors for first suicide attempt, including mental disorders and traumatic experiences that occurred before the first suicide attempt, parental history of mental disorders, and family poverty and (2) adulthood mental health outcomes, including lifetime and current prevalence of *DSM-IV* psychiatric disorders and quality of life measures.

**Results:** Suicide attempts during childhood (n = 104) were more strongly related to childhood maltreatment, while suicide attempts during adolescence (n = 415) were more strongly associated with major depressive episode. Compared to first suicide attempts during adolescence, first attempts during childhood were associated with increased risk for multiple suicide attempts (61.3% vs 32.6%), several psychiatric disorders (mania, hypomania, and panic disorder), and poorer social functioning during adulthood (all *P* values < .05).

**Conclusions:** Suicide attempts in children and adolescents substantially differ in contributing factors and adulthood mental health outcomes. Preventing childhood maltreatment and early intervention for psychiatric disorders may have broad benefits to reduce not only the suffering of these children and adolescents, but also the burden of suicide.

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The increase in the prevalence of childhood and adolescence suicides and suicide attempts during the last decades is a matter of great concern<sup>1,2</sup> and calls for a better understanding of the risk factors in this population to help refine public health preventive interventions. In the United States, suicide constitutes the fourth leading cause of death in 5- to 14-year-old children.<sup>3</sup>

In most studies, suicidal behavior among youth is usually examined without distinguishing children and adolescents.<sup>4–6</sup> However, several lines of evidence support potential differences in risk factor profiles for first suicide attempt during childhood and adolescence. First, the prevalence of suicide attempts is higher in adolescents than in children, and the male-to-female ratio of suicide is lower among prepubescent children (3:1) than in those aged 15 to 24 years (5.5:1).<sup>6</sup> Second, psychiatric disorders are among the strongest predictors of suicide attempts in adults,<sup>7</sup> but the strength of these associations may differ substantially between children and adolescents.<sup>8–10</sup> For example, several epidemiologic studies,<sup>11–16</sup> although not all,<sup>17</sup> suggest that major depressive episodes and substance use disorders may be more frequent at the time of the first suicide attempt in adolescents, whereas attention-deficit/hyperactivity disorder (ADHD) and conduct disorder may be strongly associated with first suicide attempts in children.<sup>18</sup> Finally, childhood traumatic experiences and family discord, which are strongly associated with suicide attempts,<sup>19–22</sup> may have a greater impact on the risk of suicide attempt in children than in adolescents.<sup>10,12,23,24</sup>

Furthermore, to our knowledge, no study has compared adulthood mental health outcomes (ie, occurrence of psychiatric disorders and quality of life measures) in the general population of individuals who first attempted suicide during childhood to those who first attempted suicide during adolescence.

In addition to advancing the understanding of the mechanisms that increase the risk of suicide attempt in children and adolescents, this knowledge may also have important implications for suicide prevention by allowing better identification of children and adolescents at greater risk for suicide attempt as well

- We examined whether suicide attempts in children and adolescents differ in contributing factors and adulthood mental health outcomes.
- Suicide attempt during childhood was more strongly related to childhood maltreatment, while suicide attempt during adolescence was more strongly associated with major depression.
- Suicide attempt in children was associated with increased risk for multiple suicide attempts and poorer adulthood mental health outcomes.

as those at greater risk to develop mental disorders in adulthood. This knowledge may also help refine specific assessment and disposition strategies according to the age of the first suicide attempt.

This article aims to fill this gap of knowledge and seeks to compare individuals who first attempted suicide during childhood to those who first attempted suicide during adolescence in (1) contributing factors for first suicide attempt, including mental disorders and traumatic experiences that occurred before the first suicide attempt, parental history of mental disorders, and family poverty and (2) adulthood mental health outcomes, including lifetime and current prevalence of psychiatric disorders and quality of life measures.

## METHODS

### Sample

Data were drawn from the Wave 1 and Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a nationally representative face-to-face survey of the US adult population, conducted in 2001–2002 (Wave 1) and 2004–2005 (Wave 2) by the National Institute on Alcoholism and Alcohol Abuse (NIAAA) and described in detail elsewhere.<sup>25</sup> The target population included the civilian population aged 18 years and older residing in households and group quarters. Face-to-face interviews were conducted with 43,093 respondents. The cumulative response rate at Wave 2 was 70.2%, reflecting 34,653 completed Wave 2 interviews. At Wave 2, mean age of respondents was 48.2 years (standard error [SE] = 0.2). The Wave 2 NESARC data were weighted to be representative of the US civilian population based on the 2000 census.<sup>25</sup> The research protocol, including informed consent procedures, received full human subjects review and approval from the US Census Bureau and the Office of Management and Budget.<sup>25</sup> Participants who completed both NESARC waves were included in analyses.

### Measures

**Assessment of suicide attempts and age at first suicide attempt.** All NESARC respondents were asked the following questions: (1) “Did you ever attempt suicide?” (2) “Did it happen 2 times or more?” and (3) “How old were you the

first time it happened?” Based on prior research, which used a cutoff of 13 years,<sup>14,17,26</sup> we defined 2 mutually exclusive groups: (1) participants who first attempted suicide before the age of 13 years (referred to as “children”) and (2) those who first attempted suicide from 13 through 17 years of age (referred to as “adolescents”). Multiple suicide attempts were defined as attempting suicide at least 2 times.

**Assessment of DSM-IV Axis I and II disorders.** Mental disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule, DSM-IV version (AUDADIS-IV), a structured diagnostic instrument administered by trained lay interviewers.<sup>25</sup> For all Axis I disorders, diagnoses were made in the past 12 months prior to Wave 2 and on a lifetime basis. All respondents with psychiatric disorders were also questioned about age at onset of disorders, allowing us to determine whether these disorders occurred before the first suicide attempt. Axis II disorders were assessed on a lifetime basis. The test-retest reliability and validity of AUDADIS-IV measures of DSM-IV mental disorders are good to excellent for substance use disorders and fair to good for other disorders.<sup>27–30</sup>

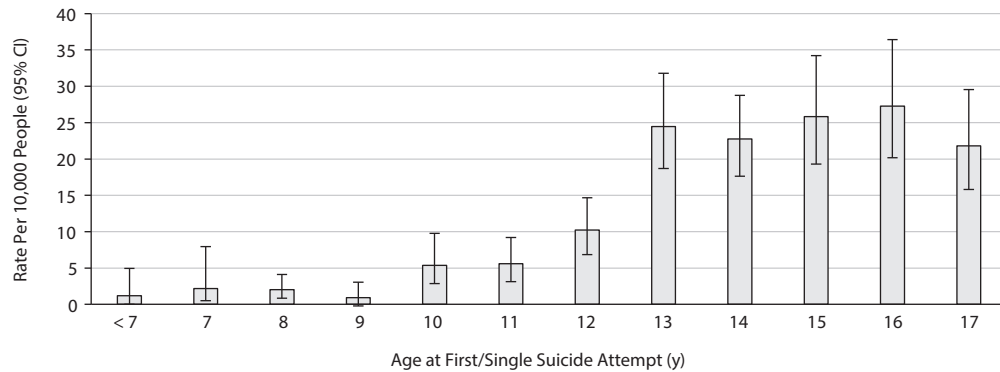
**Health-related quality of life measures.** Wave 2 participants completed version 2 of the 12-Item Short Form Health Survey (SF-12v2),<sup>31</sup> a 12-item measure that assesses life satisfaction and current functioning over the last 4 weeks. The SF-12v2 can be scored to generate norm-based scores, including social functioning, role limitations due to emotional problems, and mental health indices, and physical component summary (PCS) and mental component summary (MCS) scores. All standardized scale scores range from 0 to 100 and have a mean of 50 (SD = 10); higher scores signify better functioning. Numerous studies support the reliability and convergent validity of the SF-12v2 scale scores in both community and clinical samples.<sup>31</sup>

**Childhood traumatic experiences.** All respondents were asked about several childhood traumatic experiences and their age at first occurrence. These experiences included (1) having been sexually assaulted, molested, or raped or having experienced unwanted sex; (2) having been physically attacked/beaten/injured by parent/caretaker; (3) having been seriously neglected by parent/caretaker; and (4) having seen serious fights at home.

Five types of childhood maltreatment were examined: emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse. Respondents completed 19 questions regarding exposure to the types of maltreatment occurring before age 18 years that were adapted from the Conflict Tactics Scale (CTS)<sup>32</sup> and the Childhood Trauma Questionnaire (CTQ).<sup>33</sup> A test-retest study of these items indicated excellent intraclass test-retest reliability coefficients ranging from 0.79 for physical abuse to 0.88 for emotional abuse.<sup>30</sup> Consistent with prior work,<sup>22,34</sup> a participant was considered to have suffered a type of childhood maltreatment (eg, physical abuse) if the respondent reported frequent exposure (sometimes, often, or very often), except for sexual abuse, which was

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Figure 1. Rates per 10,000 People of Suicide Attempts Before 18 Years, by Age at First/Single Attempt



considered present if the respondent indicated at least 1 episode.

#### **Parental history of mental disorders and family poverty.**

Parental histories of alcohol use disorder, drug use disorder, major depression, and antisocial personality disorder were ascertained in separate modules of the AUDADIS<sup>28</sup> and defined in our study as having at least 1 parent with the disorder. The test-retest reliability of AUDADIS family history diagnoses is very good to excellent.<sup>35</sup>

Family poverty was considered present if participants reported that their family received money from any government assistance program before they were 18 years of age.

**Sociodemographic measures.** Sociodemographic measures included sex, race/ethnicity, nativity, age, education, individual income, family income, and marital status.

#### **Statistical Analyses**

Percentages and their SEs were estimated using SUDAAN (version 8.1; Research Triangle Institute, Research Triangle Park, North Carolina) to adjust for the complex design of the NESARC. Logistic regression analyses were performed to compare the sociodemographic and clinical characteristics and psychiatric outcomes of individuals who first attempted suicide during childhood and those who first attempted suicide during adolescence. Because sex and race/ethnicity have been shown to influence the risk for attempting suicide,<sup>7</sup> all analyses were adjusted for these variables. Statistical significance was evaluated using a 2-sided  $\alpha$  set a priori at .05.

## **RESULTS**

### **Sample Characteristics**

Of the 34,653 participants who participated in both waves, 104 (0.27% [SE=0.03%]) first attempted suicide before the age of 13 years, 415 (1.22% [SE=0.07%]) first attempted suicide from age 13 through 17 years, 33,388 had no history of suicide attempt (nonattempters), and 721 (1.82% [SE=0.09%]) first attempted suicide after the age of

17 years (Figure 1). At Wave 2, the mean age of respondents was 36.3 years (SE=1.5) among those who first attempted suicide during childhood and 36.3 years (SE=0.7) among those who first attempted suicide during adolescence. We found a significant increase in the incidence of first suicide attempt between 12 and 13 years (incidence at 12 versus incidence at 13 years;  $P$  value<.001). There were no significant differences in male-to-female ratio between child and adolescent suicide attempters (1:4; Wald  $F$ =0.8,  $P$ =.4).

### **Predictors of Suicide Attempt in Child Versus Adolescent Suicide Attempters**

Participants who first attempted suicide during adolescence were more likely to have a major depressive episode before attempting suicide than those who first attempted suicide during childhood. Participants who first attempted suicide during childhood were more frequently exposed to traumatic experiences, such as having been physically attacked/beaten/injured and having been seriously neglected by a parent/caretaker, and to several types of childhood maltreatment, including sexual abuse (Table 1).

### **Adulthood Sociodemographic Characteristics and Mental Health Outcomes in Child Versus Adolescent Suicide Attempters**

There were no significant differences in adulthood sociodemographic characteristics between participants who first attempted suicide during childhood and those who first attempted suicide during adolescence (Table 2).

Participants who first attempted suicide during childhood were more likely than those who first attempted suicide during adolescence to report a lifetime history of mania (or hypomania) and panic disorder with or without agoraphobia (Table 3). They also had a lower score on the SF-12 social functioning subscale.

After adjusting for sex and race/ethnicity, the lifetime risk of recurrence of suicide attempt (ie, at least 2 attempts) was higher in participants who first attempted suicide during childhood than in those who first attempted suicide

**Table 1. Comparing Contributing Factors for Attempting Suicide (ie, Mental Disorders and Traumatic Experiences Before the First Suicide Attempt, Parental History of Mental Disorders, and Family Poverty) of Individuals Who First Attempted Suicide Before 13 Years of Age to Those Who First Attempted Suicide at 13–17 Years of Age**

Factor	First Suicide Attempt < 13 Years <sup>a</sup> (n = 104), % (SE)	First Suicide Attempt (n = 415), % (SE)	Wald Test <sup>b</sup>		Adjusted Wald Test <sup>b,c</sup>	
			First Suicide Attempt < 13 Years vs		First Suicide Attempt < 13 Years vs	
			First Suicide Attempt 13–17 Years		First Suicide Attempt 13–17 Years	
			Wald <i>F</i>	<i>P</i> Value	Wald <i>F</i>	<i>P</i> Value
Mental disorders before the suicide attempt						
Substance use disorders						
Alcohol use disorder	1.5 (1.5)	3.9 (1.2)	1.1	.3	1.4	.2
Drug use disorder	2.9 (2.2)	5.3 (2.2)	0.6	.5	0.4	.5
Nicotine dependence	3.2 (1.8)	1.3 (0.7)	1.3	.3	1.2	.3
Mood disorders						
Major depressive episode	6.5 (2.7)	21.7 (2.7)	<b>12.2</b>	<b>&lt; .001</b>	<b>11.1</b>	<b>.001</b>
Mania or hypomania	5.7 (3.2)	6.0 (1.7)	0.0	.9	0.0	.9
Dysthymic disorder	5.2 (2.3)	8.0 (2.0)	0.7	.4	0.5	.5
Anxiety disorders						
Panic disorder with or without agoraphobia	5.8 (2.8)	3.6 (1.6)	0.5	.5	1.1	.3
Social anxiety disorder	8.2 (3.1)	15.7 (2.3)	2.8	.094	2.8	.098
Specific phobia	18.0 (4.7)	19.0 (2.7)	0.0	.9	0.0	> .9
Generalized anxiety disorder	5.2 (2.7)	3.3 (1.5)	0.2	.7	0.7	.4
Posttraumatic stress disorder	19.4 (4.7)	15.9 (2.3)	0.5	.5	0.9	.3
Attention-deficit/hyperactivity disorder	10.2 (3.7)	16.6 (2.4)	2.5	.1	1.2	.3
Pathological gambling	0.0 (0.0)	0.0 (0.0)	NA	NA	NA	NA
Conduct disorder	7.8 (3.0)	13.8 (2.5)	1.9	.2	1.6	.2
At least 1 Axis I psychiatric disorder	49.9 (6.4)	55.8 (3.2)	0.8	.4	0.5	.5
Traumatic experiences before the suicide attempt						
Unwanted sex	35.2 (5.9)	36.6 (2.8)	0.0	.8	0.0	.8
Attacked by parent/caretaker	33.7 (5.7)	19.0 (2.3)	<b>6.9</b>	<b>.010</b>	<b>6.5</b>	<b>.012</b>
Seriously neglected by parent/caretaker	36.6 (5.3)	14.9 (2.0)	<b>18.7</b>	<b>&lt; .001</b>	<b>19.4</b>	<b>&lt; .001</b>
Saw serious fights at home	46.9 (5.9)	34.9 (2.8)	3.6	.062	3.6	.060
At least 1 traumatic experience	72.1 (6.0)	60.1 (3.0)	2.9	.092	2.6	.11
Types of childhood maltreatment						
Physical neglect	10.2 (0.7)	8.0 (0.2)	<b>12.5</b>	<b>&lt; .001</b>	<b>11.6</b>	<b>&lt; .001</b>
Emotional abuse	9.2 (0.5)	7.4 (0.2)	<b>10.7</b>	<b>.001</b>	<b>11.8</b>	<b>&lt; .001</b>
Physical abuse	6.1 (0.3)	4.6 (0.2)	<b>17.0</b>	<b>&lt; .001</b>	<b>15.9</b>	<b>&lt; .001</b>
Sexual abuse	8.5 (0.6)	6.9 (0.2)	<b>7.4</b>	<b>.006</b>	<b>6.3</b>	<b>.014</b>
Emotional neglect	13.5 (0.8)	11.9 (0.4)	3.2	.076	2.6	.11
Family history of mental disorder						
Alcohol abuse	59.5 (6.5)	46.4 (3.0)	3.1	.080	3.2	.076
Drug abuse	24.9 (5.4)	16.5 (2.4)	2.4	.1	2.2	.14
Major depression	59.1 (6.5)	56.5 (3.3)	0.1	.7	0.6	.4
Antisocial personality disorder	28.6 (5.7)	31.8 (3.1)	0.3	.6	0.4	.5
Family poverty	33.5 (5.8)	29.8 (2.8)	0.4	.6	0.4	.5

<sup>a</sup>Percentages are weighted.

<sup>b</sup>Bold values indicate significance.

<sup>c</sup>Adjusted for sex and race/ethnicity.

Abbreviation: NA = not applicable.

during adolescence (adjusted odds ratio [AOR] = 3.61 [95% CI, 1.97–6.60]) (Figure 2). This difference was not attributable to the longer follow-up period after the first suicide attempt among participants who first attempted suicide during childhood (mean duration = 26.0 years) than among participants who first attempted suicide during adolescence (mean duration = 21.3 years). Indeed, the incidence per year of recurrence of suicide attempt was significantly higher in the childhood group (2.3% [95% CI, 1.9–2.8]) than in the adolescent group (1.5% [95% CI, 1.2–1.8];  $P < .001$ ).

### Sensitivity Analysis

Because the age of puberty onset varies across individuals and tends to start at younger ages,<sup>36</sup> it is difficult to precisely

determine the transition from childhood to adolescence. We thus performed a sensitivity analysis by changing the threshold for this transition from 13 to 12 years. Results were very similar (data available on request), suggesting the robustness of our findings.

### Supplementary Analysis

Individuals who attempted suicide before the age of 18 years had higher rates of all lifetime and past-year psychiatric disorders prior to Wave 2 (except for pathological gambling), greater exposure to traumatic experiences before the age of 18 years, and parental history of mental disorders. They also reported lower health-related quality of life scores in Wave 2 (see Supplementary eTables 1, 2, and 3).



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**Table 2. Adulthood Sociodemographic Characteristics of Individuals Who First Attempted Suicide Before 13 Years of Age and Those Who First Attempted Suicide at 13–17 Years of Age**

Sociodemographic	First Suicide Attempt < 13 Years <sup>a</sup> (n = 104), % (SE)	First Suicide Attempt 13–17 Years <sup>a</sup> (n = 415), % (SE)	Wald Test First Suicide Attempt < 13 Years vs First Suicide Attempt 13–17 Years	
			Wald F	P Value
Sex				
Male	23.8 (4.9)	29.2 (3.0)	0.8	.4
Female	76.2 (4.9)	70.8 (3.0)		
Race/ethnicity				
White	60.3 (6.3)	73.5 (3.0)	1.4	.2
Black	9.6 (2.8)	9.2 (1.6)		
Native American	6.4 (2.7)	3.1 (1.0)		
Asian	3.5 (1.9)	3.1 (1.3)		
Hispanic	20.2 (5.4)	11.2 (2.3)		
Nativity				
US-born	92.5 (2.3)	92.0 (2.1)	0.0	.9
Foreign-born	7.5 (2.3)	8.0 (2.1)		
Age, y				
18–29	33.0 (6.0)	34.0 (2.8)	0.1	> .9
30–44	44.3 (6.1)	44.7 (3.0)		
45–64	20.8 (4.9)	20.0 (2.5)		
65+	2.0 (1.5)	1.3 (0.6)		
Education				
Less than high school	15.1 (4.1)	13.4 (2.2)	0.3	.8
High school graduate	28.6 (5.8)	25.6 (2.8)		
Some college or higher	56.2 (6.6)	61.0 (3.4)		
Individual income				
\$0–\$19,999	61.6 (5.8)	58.0 (3.0)	0.2	.9
\$20,000–\$34,999	21.0 (4.6)	19.2 (2.4)		
\$35,000–\$69,999	14.8 (5.0)	19.6 (2.5)		
\$70,000+	2.6 (1.9)	3.2 (1.2)		
Family income				
\$0–\$19,999	34.0 (5.7)	27.3 (2.7)	0.8	.5
\$20,000–\$34,999	22.4 (5.2)	19.4 (2.2)		
\$35,000–\$69,999	26.9 (5.4)	33.3 (3.1)		
\$70,000+	16.7 (5.3)	20.0 (2.4)		
Marital status				
Married, living with someone as if married	61.6 (5.6)	51.4 (3.0)	2.4	.073
Divorced or separated	17.5 (4.0)	20.0 (2.3)		
Widowed	4.5 (2.6)	1.5 (0.6)		
Never married	16.4 (3.9)	27.2 (2.9)		

<sup>a</sup>Percentages are weighted.

## DISCUSSION

In a large, nationally representative sample of US adults, we found a net increase in the incidence of first suicide attempts after 12 years of age. Although suicide attempts result from a complex interaction between biological, psychological, social, cultural, and environmental factors,<sup>7</sup> our findings suggest that suicide attempts during childhood could be more strongly related to childhood maltreatment while suicide attempts during adolescence could be more strongly associated with major depressive episode. We also found that first suicide attempts during childhood are associated with increased risk for multiple suicide attempts, several adulthood psychiatric disorders (ie, mania or hypomania and panic disorder), and poorer social functioning than first suicide attempts during adolescence. These findings advance our understanding of suicide attempts in youth in several important ways.

Several factors may contribute to explain the net increase in the prevalence of suicide attempts after 12 years of age.

This age often marks the beginning of an important phase of mental development, including the development and the maturation of physical and cognitive capabilities and emotional self-awareness, which may lead to the onset of many psychiatric disorders and subsequent increase in risk of suicide attempt.<sup>37–40</sup> Brain-imaging studies have shown a significant developmental lag between the maturation of emotions and behavior related to the hormonal changes of puberty in early adolescence and the development of cognitive and emotional coping skills through cortical development during late adolescence.<sup>41,42</sup> For example, a study<sup>41</sup> found that the dorsolateral prefrontal cortex (linked to the ability to inhibit impulsivity and to evaluate consequences of decisions) does not reach adult dimensions until the age of 20 years. This lag may underlie important behavioral changes in healthy adolescents but may also explain why some vulnerable adolescents are prone to exhibit maladaptive cognitive (eg, self-criticism), emotional (eg, emotional coping), and social (eg, isolation)

**Table 3. Adulthood Mental Health Outcomes (ie, Occurrence of Psychiatric Disorders and Quality of Life Measures) of Individuals Who First Attempted Suicide Before 13 Years of Age and Those Who First Attempted Suicide at 13–17 Years of Age**

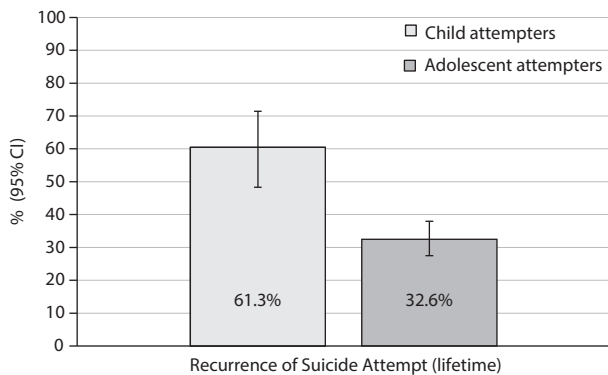
Outcome	First Suicide Attempt < 13 Years <sup>a</sup> (n= 104)	First Suicide Attempt 13–17 Years <sup>a</sup> (n=415)	Wald Test <sup>b</sup>		Adjusted Wald Test <sup>b,c</sup>	
			First Suicide Attempt < 13 Years vs First Suicide Attempt 13–17 Years		First Suicide Attempt < 13 Years vs First Suicide Attempt 13–17 Years	
			Wald F	P Value	Wald F	P Value
			Lifetime mental disorders, % (SE)			
Substance use disorders						
Alcohol use disorder	50.0 (6.5)	51.8 (3.0)	0.1	.8	0.0	>.9
Drug use disorder	43.0 (6.2)	40.6 (3.1)	0.1	.7	0.2	.6
Nicotine dependence	57.8 (6.4)	50.8 (3.3)	0.9	.3	1.7	.2
Mood disorders						
Major depressive episode	71.9 (5.7)	66.0 (2.9)	0.8	.4	0.7	.4
Mania or hypomania	44.6 (5.9)	30.4 (2.6)	<b>5.4</b>	<b>.022</b>	<b>8.5</b>	<b>.004</b>
Dysthymic disorder	33.7 (6.0)	22.6 (2.5)	3.2	.075	3.3	.071
Anxiety disorders						
Panic disorder with or without agoraphobia	42.4 (6.1)	26.7 (2.6)	<b>6.3</b>	<b>.013</b>	<b>6.7</b>	<b>.011</b>
Agoraphobia	13.1 (4.1)	12.7 (2.2)	0.0	.9	0.0	.9
Social anxiety disorder	22.6 (4.6)	28.0 (2.8)	1.1	.3	0.8	.4
Specific phobia	41.1 (6.0)	37.1 (3.1)	0.4	.5	0.5	.5
Generalized anxiety disorder	35.5 (5.5)	28.0 (2.6)	1.7	.2	2.2	.11
Posttraumatic stress disorder	48.4 (6.0)	38.7 (2.9)	2.1	.2	1.8	.18
Attention-deficit/hyperactivity disorder	16.3 (4.4)	20.2 (2.5)	0.6	.5	0.2	.7
Pathological gambling	0.3 (0.3)	0.7 (0.4)	0.6	.5	0.5	.5
Conduct disorder	26.1 (5.3)	21.9 (2.9)	0.5	.5	1.1	.3
At least 1 Axis-I psychiatric disorder	95.9 (2.1)	93.5 (1.7)	0.8	.4	1.4	.2
Personality disorders						
Avoidant	16.4 (4.6)	15.7 (2.4)	0.0	.9	0.1	.7
Dependent	4.1 (2.2)	4.5 (1.5)	0.0	.9	0.0	>.9
Obsessive-compulsive	23.0 (5.0)	22.5 (2.8)	0.0	.9	0.1	.7
Paranoid	22.2 (4.7)	18.5 (2.4)	0.5	.5	0.7	.4
Schizoid	15.5 (4.1)	13.9 (2.3)	0.1	.7	0.1	.7
Schizotypal	31.1 (5.2)	21.9 (2.6)	2.8	.1	3.2	.078
Narcissistic	20.6 (4.6)	18.8 (2.5)	0.1	.7	0.3	.6
Borderline	50.8 (6.3)	38.9 (2.8)	3.2	.075	3.5	.066
Histrionic	9.1 (3.3)	7.2 (1.8)	0.3	.6	0.6	.5
Antisocial	23.1 (5.0)	20.7 (2.9)	0.2	.7	0.6	.4
At least 1 personality disorder	75.8 (5.8)	67.0 (2.6)	1.7	.19	2.3	.13
At least 1 Axis I or personality disorder	97.7 (1.3)	95.1 (1.5)	1.9	.2	3.7	.058
Past year mental disorders, % (SE)						
Substance use disorders						
Alcohol use disorder	16.6 (4.3)	15.7 (2.1)	0.0	.8	0.2	.7
Drug use disorder	11.8 (4.0)	14.8 (2.4)	0.4	.5	0.3	.6
Nicotine dependence	41.3 (5.7)	35.2 (2.9)	1.0	.3	1.5	.2
Mood disorders						
Major depressive episode	39.3 (5.9)	31.0 (2.9)	1.7	.2	2.2	.14
Mania or hypomania	25.7 (4.9)	18.3 (2.3)	2.3	.1	3.0	.088
Dysthymic disorder	10.8 (4.6)	5.1 (1.0)	2.5	.1	2.2	.14
Anxiety disorders						
Panic disorder with or without agoraphobia	16.6 (4.4)	13.6 (2.1)	0.4	.5	0.5	.5
Agoraphobia	10.1 (3.7)	7.2 (1.5)	0.8	.4	0.7	.4
Social anxiety disorder	17.1 (4.2)	13.4 (2.0)	0.7	.4	0.7	.4
Specific phobia	26.0 (5.4)	22.4 (2.4)	0.5	.5	0.3	.6
Generalized anxiety disorder	15.9 (2.1)	15.9 (4.1)	0.0	>.9	0.0	.9
Posttraumatic stress disorder	42.6 (5.9)	30.1 (2.8)	3.7	.057	3.6	.061
At least 1 Axis I psychiatric disorder	77.0 (5.2)	73.2 (2.8)	0.4	.5	0.6	.4
Health-related quality of life (Wave 2), mean (SE)						
Physical component	48.0 (1.5)	48.7 (0.7)	0.2	.7	0.3	.6
Mental component	43.0 (1.5)	45.3 (0.6)	2.1	.2	1.9	.17
Social functioning	42.7 (1.6)	46.5 (0.8)	<b>4.9</b>	<b>.029</b>	<b>4.6</b>	<b>.034</b>
Role emotional	42.3 (1.2)	44.5 (0.6)	2.8	.1	3.0	.087
Mental health	44.1 (1.5)	45.7 (0.7)	1.0	.3	1.0	.3

<sup>a</sup>Percentages are weighted.<sup>b</sup>Bold values indicate significance.<sup>c</sup>Adjusted for sex and race/ethnicity.

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**Figure 2. Lifetime Risk of Recurrence of Suicide Attempts Among Child and Adolescent Suicide Attempters**



strategies,<sup>39,40,43</sup> which may increase the risk for attempting suicide. Finally, adolescence is a period characterized by new social stressors (eg, peer-rejection, academic pressure, bullying), less perceived support from adults,<sup>44,45</sup> and, for certain adolescents, a major identity crisis (eg, sexual, social).<sup>46,47</sup>

We found that maltreatment experiences could be a strong risk factor for attempting suicide during childhood and adolescence. Most children and adolescents who attempted suicide reported sexual abuse. Childhood maltreatment, particularly sexual abuse, affects developmental processes related to the strengthening of interpersonal and emotion regulation<sup>19,48,49</sup> and increased impulsivity and neuroticism.<sup>38,48,50–54</sup> These disruptions may decrease the threshold for suicidal behavior in youths experiencing stressful events,<sup>48,49</sup> possibly through epigenetic modifications.<sup>55</sup> Because childhood maltreatment is the result of an ecology of many factors (eg, family dysfunction, maladaptive parent-child interactions) within the parenting context of a child,<sup>56</sup> the interaction of these factors may contribute to increase the risk of suicide attempt. The decreased social support associated with childhood maltreatment<sup>57</sup> might also contribute to explain this association.<sup>23</sup> In our study, participants who first attempted suicide before the age of 13 years were more likely to have a history of childhood maltreatment than participants who first attempted suicide in adolescence. These findings are in line with prior research showing that childhood maltreatment can have long-term psychological and neurobiological effects, particularly when it occurs at a younger age.<sup>58–60</sup> For example, one study<sup>59</sup> found that sexual abuse was more strongly related to alterations in the hippocampus if it occurred during the ages of 3 to 5 years and 11 to 13 years than during adolescence. Together with these previous findings, our results suggest that exposure to childhood maltreatment during prepubescent ages can lead to particularly detrimental long-term outcomes, including suicide attempts.

Our results suggest that suicide attempts in adolescence may be more strongly related to major depressive episode

than in children. In line with previous studies,<sup>11–15</sup> the prevalence of major depressive episode was higher before the first suicide attempt in adolescents (21.7%) than in children (6.5%). There is already evidence that the brain circuitry and neurochemical abnormalities related to major depressive episode can disrupt the underlying neurobiological structures involved in stress response and the susceptibility to environmental influences,<sup>38</sup> particularly the hypothalamic–pituitary–adrenal (HPA) axis,<sup>61</sup> which is involved in the regulation of emotion. Since emotion dysregulation is highly related to suicidal behavior in adolescents,<sup>62</sup> this may account, at least in part, for the increased risk of suicide attempts in adolescents compared to children.

Attempting suicide during childhood and adolescence was associated with poor adulthood mental health outcomes, particularly in those who first attempted suicide during childhood. Participants with a history of suicide attempt during childhood were more likely than participants with such a history during adolescence to attempt suicide a second time (61.3% vs 32.6%) and to present mania or hypomania and panic disorder in adulthood. Exposure to childhood maltreatment has been consistently shown to increase the lifetime risk for many psychiatric disorders, including mood<sup>63–65</sup> and anxiety disorders,<sup>64,66</sup> and has also been recognized as an independent risk factor for suicidal behavior.<sup>22</sup> The greater exposure to childhood maltreatment experiences in participants who first attempted suicide before the age of 13 years may explain this increased risk for mood and anxiety disorders<sup>67</sup> and for recurrence of suicide attempts.<sup>22</sup>

Our findings have important implications. First, our results support that distinguishing first suicide attempts during childhood and adolescence is relevant because we found that these 2 populations substantially differ in contributing factors and adulthood mental health outcomes in a nationally representative sample. This finding suggests the need to distinguish child and adolescent suicide attempters in the study of suicidal behavior among youth. Secondly, given that most children and adolescents who attempted suicide had experienced childhood maltreatment, all children and adolescents who attempted suicide should be systematically assessed for childhood maltreatment. Additionally, these results suggest that preventing actual child maltreatment with evidence-based interventions<sup>68</sup> could also decrease the risk of suicide attempt. Last, our findings highlight the need to closely follow up children and adolescents who attempted suicide to prevent the risk of suicide and the occurrence of mental disorders in adulthood.

This study has several limitations. First, the participants included in our study had experienced exclusively nonfatal suicide attempts; thus, the results of our study could not be extrapolated to individuals who died by suicide. Second, retrospective reporting of suicide attempts and childhood maltreatment may be subject to recall bias.<sup>69–71</sup> In addition, clinical information on suicide attempt was limited since

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the NESARC was not originally designed to examine specifically suicidal behavior. Future research efforts should replicate these results using more established assessments of suicidal behavior, such as the Suicide Attempt Self-Injury Interview.<sup>72</sup> Third, information on specific mental disorders (such as bipolar disorder) or parental environmental context (such as family discord), which has been found to be linked with higher suicidal intent,<sup>73</sup> was not available in the NESARC. Finally, adolescents and children may use different means to attempt suicide, which may complicate the assessment of suicide attempt.<sup>74,75</sup> However, such data were not available in the NESARC and, thus, could not be incorporated in our study.

## CONCLUSION

We found that suicide attempts in children and adolescents have substantially different contributing factors and adulthood mental health outcomes. Preventing childhood maltreatment and early intervention for psychiatric disorders may have broad benefits to reduce not only the suffering of these children and adolescents, but also the burden of suicide.

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**Potential conflicts of interest:** Dr Lemogne has received honoraria for board membership from Lundbeck and for speaking at invited symposia from AstraZeneca, Daiichi-Sankyo, Lundbeck, and Servier. Dr Limosin is a member of the speakers/advisory boards for Janssen, Euthérapie, Lundbeck, and Roche. Drs Peyre, Hoertel, Stordeur, Lebeau, Blanco, Basmaci, and Delorme and Ms McMahon have no conflicts to disclose.

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**Additional information:** Due to increasing concerns for confidentiality of individuals participating in US Government and other surveys, the National Institute on Alcoholism and Alcohol Abuse has determined that the Wave 1 and 2 National Epidemiologic Survey on Alcohol and Related Conditions be designated as limited-access data files. Information on procedures for accessing the Wave 1 and 2 data are currently being developed. For more information, see this NIAAA Web site: [www.niaaa.nih.gov](http://www.niaaa.nih.gov).

**Supplementary material:** See accompanying pages.

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**Editor's Note:** We encourage authors to submit papers for consideration as a part of our Focus on Suicide section. Please contact Philippe Courtet, MD, PhD, at pcourtet@psychiatrist.com.

Supplementary material follows this article.



## **Supplementary Material**

**Article Title:** Contributing Factors and Mental Health Outcomes of First Suicide Attempt During Childhood and Adolescence: Results From a Nationally Representative Study

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### **List of Supplementary Material for the article**

1. [eTable 1](#) Comparing Contributing Factors for Attempting Suicide (i.e., Childhood Maltreatment, Parental History of Mental Disorders and Family Poverty) Of Individuals Who First Attempted Suicide Before 13 Years and Those Who First Attempted Suicide Between 13 and 17 Years to Non-Attempters
2. [eTable 2](#) Comparing Adulthood Sociodemographic Characteristics of Individuals Who First Attempted Suicide Before 13 Years and Those Who First Attempted Suicide Between 13 and 17 Years to Non-Attempters
3. [eTable 3](#) Comparing Adulthood Mental Health Outcomes (i.e., Occurrence Of Psychiatric Disorders and Quality of Life Measures) of Individuals Who First Attempted Suicide Before 13 Years and Those Who First Attempted Between 13 and 17 Years to Non-Attempters

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This Supplementary Material has been provided by the author(s) as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

**Supplementary Table 1.** Comparing contributing factors for attempting suicide (i.e., childhood maltreatment, parental history of mental disorders and family poverty) of individuals who first attempted suicide before 13 years and those who first attempted suicide between 13 and 17 years to non-attempters.

	First suicide attempt < 13 years	First suicide attempt between 13 and 17 years	First suicide attempt < 18 years	Controls	ADJUSTED WALD TEST <sup>a</sup>		ADJUSTED WALD TEST <sup>a</sup>		ADJUSTED WALD TEST <sup>a</sup>	
					First suicide attempt < 13 years		First suicide attempt between 13 and 17 years		First suicide attempt < 18 years	
					vs. Controls		vs. Controls		vs. Controls	
					Wald-F	p-value	Wald-F	p-value	Wald-F	p-value
<b>TYPES OF CHILDHOOD MALTREATMENT</b>	(n = 104) % (SE)	(n = 415) % (SE)	(n = 519) % (SE)	(n = 33388) % (SE)						
Physical neglect	10.2 (0.7)	8.0 (0.2)	8.4 (0.2)	6.0 (0.0)	<b>142.5</b>	<b>&lt;0.001</b>	<b>158.3</b>	<b>&lt;0.001</b>	<b>236.3</b>	<b>&lt;0.001</b>
Emotional abuse	9.2 (0.5)	7.4 (0.2)	7.7 (0.2)	4.3 (0.0)	<b>150.4</b>	<b>&lt;0.001</b>	<b>277.2</b>	<b>&lt;0.001</b>	<b>388.5</b>	<b>&lt;0.001</b>
Physical abuse	6.1 (0.3)	4.6 (0.2)	4.9 (0.2)	2.8 (0.0)	<b>219.2</b>	<b>&lt;0.001</b>	<b>255.9</b>	<b>&lt;0.001</b>	<b>387.0</b>	<b>&lt;0.001</b>
Sexual abuse	8.5 (0.6)	6.9 (0.2)	7.2 (0.2)	4.3 (0.0)	<b>173.2</b>	<b>&lt;0.001</b>	<b>310.6</b>	<b>&lt;0.001</b>	<b>393.1</b>	<b>&lt;0.001</b>
Emotional neglect	13.5 (0.8)	11.9 (0.4)	12.2 (0.3)	8.1 (0.0)	<b>78.8</b>	<b>&lt;0.001</b>	<b>212.6</b>	<b>&lt;0.001</b>	<b>273.8</b>	<b>&lt;0.001</b>
<b>FAMILY HISTORY OF MENTAL DISORDER</b>										
Alcohol abuse	59.5 (6.5)	46.4 (3.0)	48.7 (2.7)	21.3 (0.4)	<b>24.6</b>	<b>&lt;0.001</b>	<b>51.0</b>	<b>&lt;0.001</b>	<b>75.7</b>	<b>&lt;0.001</b>
Drug abuse	24.9 (5.4)	16.5 (2.4)	18.0 (2.3)	3.4 (0.1)	<b>22.0</b>	<b>&lt;0.001</b>	<b>33.2</b>	<b>&lt;0.001</b>	<b>49.5</b>	<b>&lt;0.001</b>
Major depression	59.1 (6.5)	56.5 (3.3)	56.9 (3.0)	23.5 (0.5)	<b>21.4</b>	<b>&lt;0.001</b>	<b>74.8</b>	<b>&lt;0.001</b>	<b>95.1</b>	<b>&lt;0.001</b>
Antisocial personality disorder	28.6 (5.7)	31.8 (3.1)	31.2 (2.9)	8.1 (0.3)	<b>13.2</b>	<b>&lt;0.001</b>	<b>80.6</b>	<b>&lt;0.001</b>	<b>83.1</b>	<b>&lt;0.001</b>
<b>FAMILY POVERTY</b>	33.5 (5.8)	29.8 (2.8)	30.5 (2.5)	12.7 (0.4)	<b>5.8</b>	<b>0.018</b>	<b>28.0</b>	<b>&lt;0.001</b>	<b>33.7</b>	<b>&lt;0.001</b>

Percentages are weighted.

<sup>a</sup> Adjusted for sex, race/ethnicity, nativity, age, individual and family incomes, and marital status.

**Supplementary Table 2.** Comparing adulthood sociodemographic characteristics of individuals who first attempted suicide before 13 years and those who first attempted suicide between 13 and 17 years to non-attempters.

	First suicide attempt < 13 years	First suicide attempt between 13 and 17 years	First suicide attempt < 18 years	Controls	WALD TEST		WALD TEST		WALD TEST	
					First suicide attempt < 13 years		First suicide attempt between 13 and 17 years		First suicide attempt < 18 years	
					vs. Controls		vs. Controls		vs. Controls	
					Wald-F	p-value	Wald-F	p-value	Wald-F	p-value
	(n = 104) % (SE)	(n = 415) % (SE)	(n = 519) % (SE)	(n = 33388) % (SE)						
SOCIODEMOGRAPHICS										
Sex										
Male	23.8 (4.9)	29.2 (3.0)	28.2 (2.6)	48.5 (0.4)	16.4	<0.001	32.4	<0.001	45.1	<0.001
Female	76.2 (4.9)	70.8 (3.0)	71.8 (0.4)	51.5 (0.4)						
Race/ethnicity										
White	60.3 (6.3)	73.5 (3.0)	71.1 (2.7)	70.9 (1.6)	2.6	0.040	0.9	0.4	1.8	0.13
Black	9.6 (2.8)	9.2 (1.6)	9.2 (1.4)	11.1 (0.7)						
Native American	6.4 (2.7)	3.1 (1.0)	3.7 (1.0)	2.1 (0.2)						
Asian	3.5 (1.9)	3.1 (1.3)	3.2 (1.1)	4.3 (0.5)						
Hispanic	20.2 (5.4)	11.2 (2.3)	12.8 (2.2)	11.6 (1.2)						
Nativity										
US-born	92.5 (2.3)	92.0 (2.1)	92.1 (1.9)	86.0 (1.4)	5.1	0.026	5.7	0.018	8.1	0.005
Foreign-born	7.5 (2.3)	8.0 (2.1)	7.9 (1.9)	14.0 (1.4)						
Age, years										
18–29	33.0 (6.0)	34.0 (2.8)	33.8 (2.5)	16.2 (0.3)	7.9	<0.001	34.2	<0.001	39.6	<0.001
30–44	44.3 (6.1)	44.7 (3.0)	44.6 (2.7)	29.4 (0.4)						
45–64	20.8 (4.9)	20.0 (2.5)	20.8 (2.2)	34.6 (0.3)						
65+	2.0 (1.5)	1.3 (0.6)	1.4 (0.5)	19.8 (0.4)						
Education										
Less than high school	15.1 (4.1)	13.4 (2.2)	13.7 (2.1)	14.0 (0.5)	0.1	0.9	0.3	0.7	0.2	0.8
High school graduate	28.6 (5.8)	25.6 (2.8)	26.2 (2.6)	27.6 (0.6)						
Some college or higher	56.2 (6.6)	61.0 (3.4)	60.1 (3.2)	58.5 (0.7)						
Individual income										
\$0–19 999	61.6 (5.8)	58.0 (3.0)	58.7 (2.7)	41.5 (0.6)	4.0	0.009	10.4	<0.001	14.4	<0.001
\$20 000–34 999	21.0 (4.6)	19.2 (2.4)	19.6 (2.1)	23.2 (0.4)						
\$35 000–69 999	14.8 (5.0)	19.6 (2.5)	18.7 (2.2)	24.6 (0.4)						
\$70 000+	2.6 (1.9)	3.2 (1.2)	3.1 (1.0)	10.6 (0.5)						
Family income										
\$0–19 999	34.0 (5.7)	27.3 (2.7)	28.5 (2.4)	19.2 (0.5)	3.9	0.011	6.6	<0.001	9.5	<0.001
\$20 000–34 999	22.4 (5.2)	19.4 (2.2)	19.9 (2.1)	18.8 (0.4)						
\$35 000–69 999	26.9 (5.4)	33.3 (3.1)	32.1 (2.6)	32.3 (0.4)						
\$70 000+ 23.25	16.7 (5.3)	20.0 (2.4)	19.4 (2.3)	29.7 (0.8)						
Marital status										
Married, living with someone as if married	61.6 (5.6)	51.4 (3.0)	53.3 (2.8)	64.2 (0.5)	1.3	0.3	17.4	<0.001	15.8	<0.001
Divorced or separated	17.5 (4.0)	20.0 (2.3)	49.5 (2.1)	11.2 (0.2)						



Widowed	4.5 (2.6)	1.5 (0.6)	2.0 (0.7)	7.3 (0.2)
Never married	16.4 (3.9)	27.2 (2.9)	25.2 (2.5)	17.2 (0.5)

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Percentages are weighted.

**Supplementary Table 3.** Comparing adulthood mental health outcomes (i.e., occurrence of psychiatric disorders and quality of life measures) of individuals who first attempted suicide before 13 years and those who first attempted between 13 and 17 years to non-attempters.

	First suicide attempt < 13 years	First suicide attempt between 13 and 17 years	First suicide attempt < 18 years	Controls	ADJUSTED WALD TEST <sup>a</sup>		ADJUSTED WALD TEST <sup>a</sup>		ADJUSTED WALD TEST <sup>a</sup>	
					First suicide attempt < 13 years		First suicide attempt between 13 and 17 years		First suicide attempt < 18 years	
					vs.		vs.		vs.	
					Controls		Controls		Controls	
	(n = 104)	(n = 415)	(n = 519)	(n = 33388)	Wald-F	p-value	Wald-F	p-value	Wald-F	p-value
	% (SE)	% (SE)	% (SE)	% (SE)						
<b>LIFETIME MENTAL DISORDERS</b>										
Substance use disorders										
Alcohol use disorder	50.0 (6.5)	51.8 (3.0)	51.5 (2.8)	33.8 (0.8)	<b>7.9</b>	<b>0.006</b>	<b>26.0</b>	<b>&lt;0.001</b>	<b>32.8</b>	<b>&lt;0.001</b>
Drug use disorder	43.0 (6.2)	40.6 (3.1)	41.0 (2.8)	11.2 (0.3)	<b>35.2</b>	<b>&lt;0.001</b>	<b>115.6</b>	<b>&lt;0.001</b>	<b>150.1</b>	<b>&lt;0.001</b>
Nicotine dependence	57.8 (6.4)	50.8 (3.3)	52.1 (2.9)	22.2 (0.5)	<b>21.9</b>	<b>&lt;0.001</b>	<b>74.6</b>	<b>&lt;0.001</b>	<b>95.8</b>	<b>&lt;0.001</b>
Mood disorders										
Major depressive episode	71.9 (5.7)	66.0 (2.9)	67.1 (2.6)	20.3 (0.4)	<b>42.1</b>	<b>&lt;0.001</b>	<b>178.5</b>	<b>&lt;0.001</b>	<b>235.8</b>	<b>&lt;0.001</b>
Mania or hypomania	44.6 (5.9)	30.4 (2.6)	33.0 (2.4)	7.6 (0.2)	<b>55.0</b>	<b>&lt;0.001</b>	<b>87.2</b>	<b>&lt;0.001</b>	<b>132.5</b>	<b>&lt;0.001</b>
Dysthymic disorder	33.7 (6.0)	22.6 (2.5)	24.6 (2.3)	4.3 (0.1)	<b>67.9</b>	<b>&lt;0.001</b>	<b>101.2</b>	<b>&lt;0.001</b>	<b>153.5</b>	<b>&lt;0.001</b>
Anxiety disorders										
Panic disorder with or without agoraphobia	42.4 (6.1)	26.7 (2.6)	29.6 (2.4)	6.6 (0.2)	<b>55.4</b>	<b>&lt;0.001</b>	<b>87.1</b>	<b>&lt;0.001</b>	<b>142.4</b>	<b>&lt;0.001</b>
Agoraphobia	13.1 (4.1)	12.7 (2.2)	12.8 (1.9)	1.7 (0.1)	<b>18.6</b>	<b>&lt;0.001</b>	<b>56.5</b>	<b>&lt;0.001</b>	<b>72.9</b>	<b>&lt;0.001</b>
Social anxiety disorder	22.6 (4.6)	28.0 (2.8)	27.0 (2.5)	6.3 (0.2)	<b>20.9</b>	<b>&lt;0.001</b>	<b>103.2</b>	<b>&lt;0.001</b>	<b>110.4</b>	<b>&lt;0.001</b>
Specific phobia	41.1 (6.0)	37.1 (3.1)	37.9 (2.9)	14.4 (0.4)	<b>19.3</b>	<b>&lt;0.001</b>	<b>49.1</b>	<b>&lt;0.001</b>	<b>61.0</b>	<b>&lt;0.001</b>
Generalized anxiety disorder	35.5 (5.5)	28.0 (2.6)	29.3 (2.4)	6.8 (0.2)	<b>46.3</b>	<b>&lt;0.001</b>	<b>99.4</b>	<b>&lt;0.001</b>	<b>138.1</b>	<b>&lt;0.001</b>
Post-traumatic stress disorder	48.4 (6.0)	38.7 (2.9)	40.5 (2.5)	8.4 (0.2)	<b>67.3</b>	<b>&lt;0.001</b>	<b>182.2</b>	<b>&lt;0.001</b>	<b>268.2</b>	<b>&lt;0.001</b>
Attention deficit-hyperactivity disorder	16.3 (4.4)	20.2 (2.5)	19.5 (2.2)	2.0 (0.1)	<b>33.9</b>	<b>&lt;0.001</b>	<b>145.0</b>	<b>&lt;0.001</b>	<b>161.7</b>	<b>&lt;0.001</b>
Pathological gambling	0.3 (0.3)	0.7 (0.4)	0.6 (0.3)	0.4 (0.1)	0.0	0.9	1.0	0.3	0.9	0.4
Conduct disorder	26.1 (5.3)	21.9 (2.9)	22.7 (2.6)	4.2 (0.2)	<b>50.1</b>	<b>&lt;0.001</b>	<b>99.8</b>	<b>&lt;0.001</b>	<b>137.8</b>	<b>&lt;0.001</b>
At least one Axis-I psychiatric disorder	95.9 (2.1)	93.5 (1.7)	93.9 (1.5)	61.9 (0.7)	<b>20.2</b>	<b>&lt;0.001</b>	<b>55.7</b>	<b>&lt;0.001</b>	<b>66.3</b>	<b>&lt;0.001</b>
Personality disorders										
Avoidant	16.4 (4.6)	15.7 (2.4)	15.9 (2.1)	1.9 (0.1)	<b>33.3</b>	<b>&lt;0.001</b>	<b>87.8</b>	<b>&lt;0.001</b>	<b>108.8</b>	<b>&lt;0.001</b>
Dependent	4.1 (2.2)	4.5 (1.5)	4.4 (1.3)	0.3 (0.0)	<b>13.3</b>	<b>&lt;0.001</b>	<b>33.0</b>	<b>&lt;0.001</b>	<b>40.5</b>	<b>&lt;0.001</b>
Obsessive-compulsive	23.0 (5.0)	22.5 (2.8)	22.6 (2.4)	7.6 (0.2)	<b>16.4</b>	<b>&lt;0.001</b>	<b>49.4</b>	<b>&lt;0.001</b>	<b>63.0</b>	<b>&lt;0.001</b>
Paranoid	22.2 (4.7)	18.5 (2.4)	19.2 (2.1)	3.8 (0.2)	<b>28.1</b>	<b>&lt;0.001</b>	<b>64.2</b>	<b>&lt;0.001</b>	<b>88.5</b>	<b>&lt;0.001</b>
Schizoid	15.5 (4.1)	13.9 (2.3)	14.2 (2.0)	2.7 (0.1)	<b>24.5</b>	<b>&lt;0.001</b>	<b>53.3</b>	<b>&lt;0.001</b>	<b>72.6</b>	<b>&lt;0.001</b>
Schizotypal	31.1 (5.2)	21.9 (2.6)	23.6 (2.3)	3.3 (0.1)	<b>89.5</b>	<b>&lt;0.001</b>	<b>142.0</b>	<b>&lt;0.001</b>	<b>206.2</b>	<b>&lt;0.001</b>
Narcissistic	20.6 (4.6)	18.8 (2.5)	19.1	5.8 (0.2)	<b>22.3</b>	<b>&lt;0.001</b>	<b>47.4</b>	<b>&lt;0.001</b>	<b>64.9</b>	<b>&lt;0.001</b>
Borderline	50.8 (6.3)	38.9 (2.8)	41.1 (2.7)	4.6 (0.2)	<b>117.1</b>	<b>&lt;0.001</b>	<b>288.5</b>	<b>&lt;0.001</b>	<b>387.3</b>	<b>&lt;0.001</b>
Histrionic	9.1 (3.3)	7.2 (1.8)	7.5 (1.5)	1.6 (0.1)	<b>11.6</b>	<b>&lt;0.001</b>	<b>15.9</b>	<b>&lt;0.001</b>	<b>24.8</b>	<b>&lt;0.001</b>
Antisocial	23.1 (5.0)	20.7 (2.9)	21.2 (2.6)	3.4 (0.2)	<b>46.8</b>	<b>&lt;0.001</b>	<b>101.1</b>	<b>&lt;0.001</b>	<b>129.2</b>	<b>&lt;0.001</b>
At least one personality disorder	75.8 (5.8)	67.0 (2.6)	68.6 (2.4)	19.9 (0.4)	<b>54.8</b>	<b>&lt;0.001</b>	<b>254.9</b>	<b>&lt;0.001</b>	<b>293.9</b>	<b>&lt;0.001</b>
At least one Axis-I or personality disorder	97.7 (1.3)	95.1 (1.5)	95.6 (1.3)	64.4 (0.7)	<b>25.5</b>	<b>&lt;0.001</b>	<b>51.7</b>	<b>&lt;0.001</b>	<b>59.0</b>	<b>&lt;0.001</b>
<b>PAST YEAR MENTAL DISORDERS</b>										

Substance use disorder										
Alcohol use disorder	16.6 (4.3)	15.7 (2.1)	15.8 (1.9)	9.4 (0.3)	3.3	0.073	3.4	0.067	5.5	0.021
Drug use disorder	11.8 (4.0)	14.8 (2.4)	14.2 (2.2)	2.1 (0.1)	13.7	<0.001	69.9	<0.001	79.9	<0.001
Nicotine dependence	41.3 (5.7)	35.2 (2.9)	36.3 (2.7)	13.1 (0.4)	25.8	<0.001	57.3	<0.001	74.8	<0.001
Mood disorders										
Major depressive episode	39.3 (5.9)	31.0 (2.9)	32.5 (2.6)	7.4 (0.2)	38.9	<0.001	89.5	<0.001	127.8	<0.001
Mania or hypomania	25.7 (4.9)	18.3 (2.3)	19.6 (2.1)	2.8 (0.1)	53.9	<0.001	90.3	<0.001	122.2	<0.001
Dysthymic disorder	10.8 (4.6)	5.1 (1.0)	6.2 (1.2)	1.0 (0.1)	22.3	<0.001	28.6	<0.001	41.0	<0.001
Anxiety disorders										
Panic disorder with or without agoraphobia	16.6 (4.4)	13.6 (2.1)	14.1 (1.9)	2.2 (0.1)	23.1	<0.001	59.7	<0.001	79.6	<0.001
Agoraphobia	10.1 (3.7)	7.2 (1.5)	7.8 (1.4)	0.7 (0.1)	25.3	<0.001	57.6	<0.001	80.6	<0.001
Social anxiety disorder	17.1 (4.2)	13.4 (2.0)	14.1 (1.8)	2.1 (0.1)	35.7	<0.001	57.0	<0.001	79.4	<0.001
Specific phobia	26.0 (5.4)	22.4 (2.4)	23.0 (2.3)	7.0 (0.2)	17.9	<0.001	46.6	<0.001	58.2	<0.001
Generalized anxiety disorder	15.9 (2.1)	15.9 (4.1)	15.9 (1.9)	3.3 (0.1)	17.0	<0.001	63.9	<0.001	82.7	<0.001
Post-traumatic stress disorder	42.6 (5.9)	30.1 (2.8)	32.4 (2.5)	5.6 (0.2)	79.3	<0.001	138.6	<0.001	211.1	<0.001
At least one Axis-I psychiatric disorder	77.0 (5.2)	73.2 (2.8)	73.9 (2.5)	33.5 (0.5)	30.0	<0.001	94.8	<0.001	124.0	<0.001
HEALTH-RELATED QUALITY OF LIFE (WAVE 2), mean (SE)										
Physical Component	48.0 (1.5)	48.7 (0.7)	48.5 (0.7)	50.5 (0.1)	11.1	0.001	47.7	<0.001	56.4	<0.001
Mental Component	43.0 (1.5)	45.3 (0.6)	44.9 (0.6)	51.8 (0.1)	30.4	<0.001	80.0	<0.001	98.9	<0.001
Social Functioning	42.7 (1.6)	46.5 (0.8)	45.8 (0.7)	52.0 (0.1)	49.7	<0.001	72.5	<0.001	114.8	<0.001
Role Emotional	42.3 (1.2)	44.5 (0.6)	44.1 (0.6)	49.8 (0.1)	34.4	<0.001	97.2	<0.001	112.1	<0.001
Mental Health	44.1 (1.5)	45.7 (0.7)	45.4 (0.6)	52.4 (0.1)	25.7	<0.001	71.8	<0.001	92.6	<0.001

Percentages are weighted.  
<sup>a</sup> Adjusted for sex, race/ethnicity, nativity, age, individual and family incomes, and marital status.